Getting Started with the XG

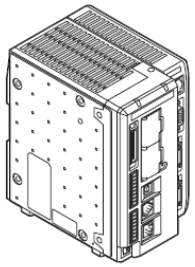
Table of Contents

1. Unpacking and verifying contents (Identify Part Numbers):

Before using and installing the trial unit –please verify contents with attached packing list located outside of the box. Here is list of typical part numbers (actual part numbers may vary):

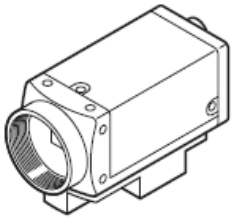
Typical Controller Part Numbers:

CV-5502(P)	XG-7502(P)
CV-5702 (P)	XG-7702(P)



Typical Camera Part Numbers:

CV-(H)035M	XG-(H)035M
CV-(H)035C	XG-(H)035C
CV-(H)200M	XG-(H)200M
CV-(H)200C	XG-(H)200C
CV-(H)500M	XG-(H)500M
CV-(H)500C	XG-(H)500C

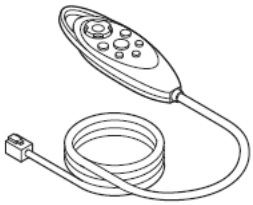


Typical Camera Cable Part Numbers:

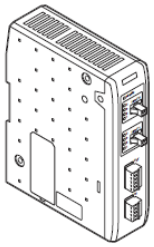
CA-CN3	CA-CN10	CA-CN17
CA-CH3	CA-CH10	

Other Typical Part Numbers:

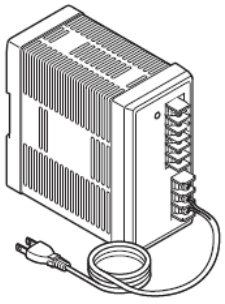
Handheld Pendant (OP-84321)



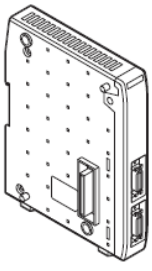
Illumination Expansion Unit (CA-DC20E or CA-DC21E)



24 VDC Power Supply (CA-U2 or CA-U3)

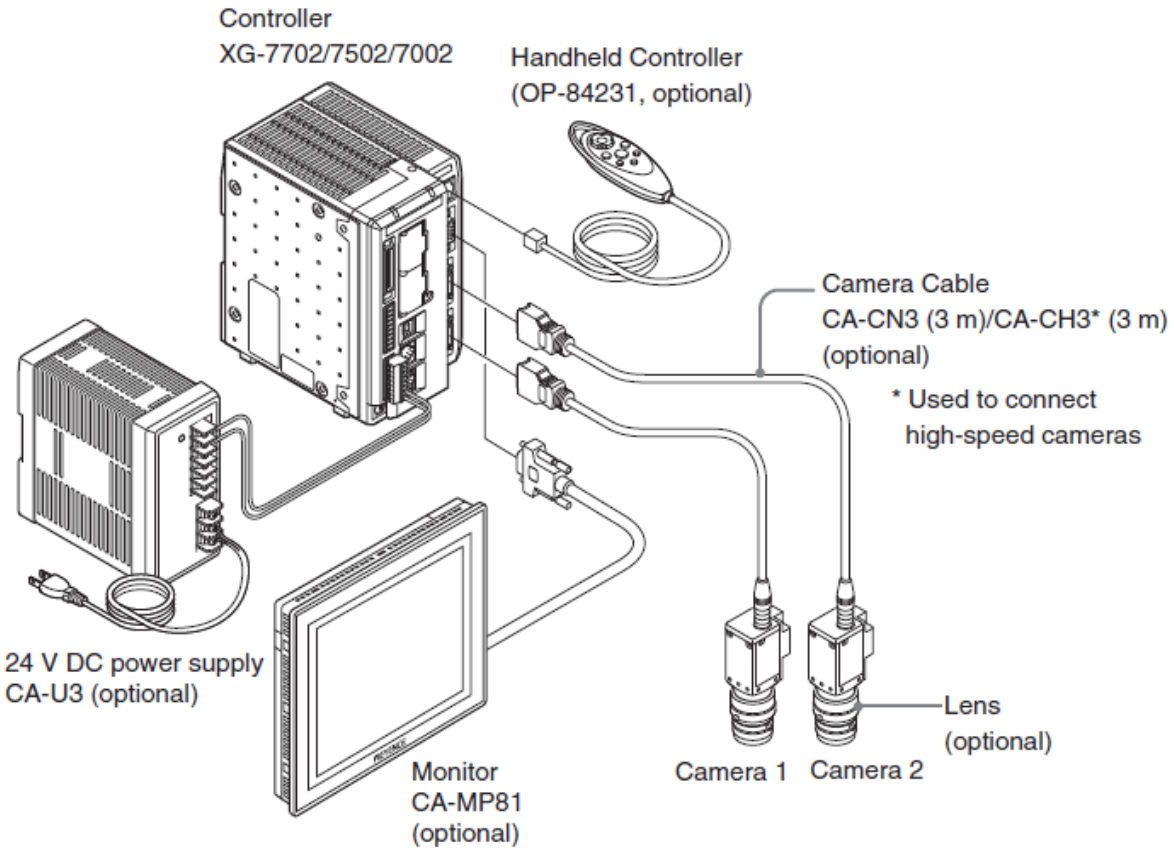


Camera Expansion Unit (CV-E500 or XG-700)

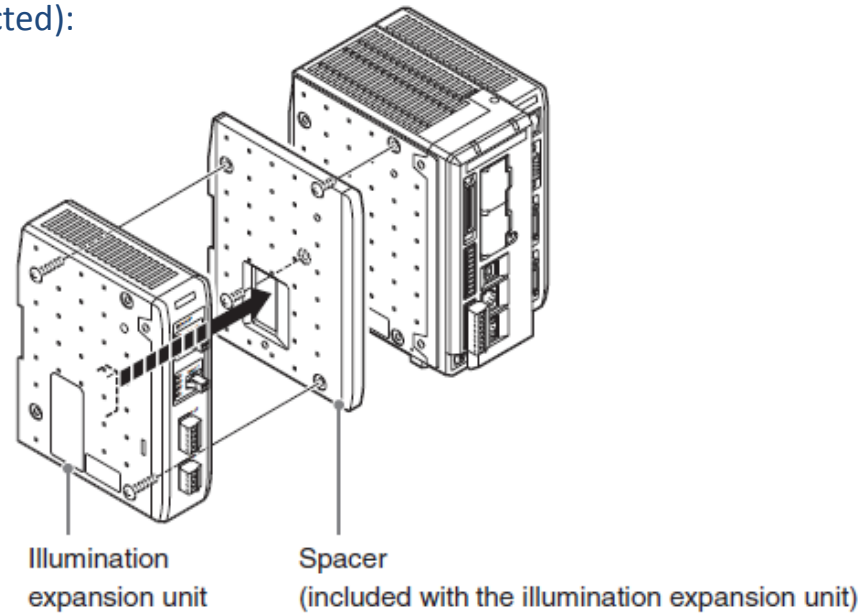


Optional Item – if using more than 2 cameras

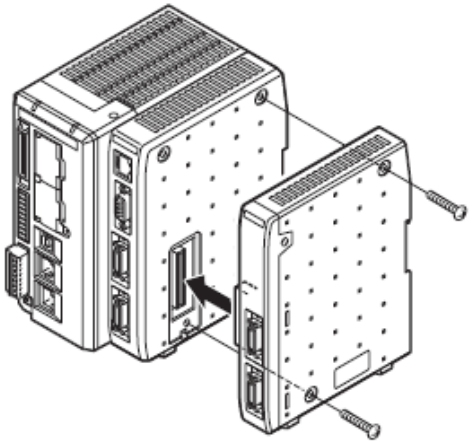
2. System Connection Overview (2 camera example):



3. Connecting the CA-DC21E to the controller (Up to 4 CA-DC21E can be connected):

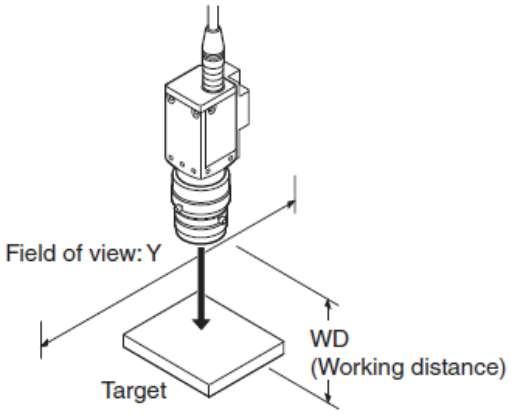


4. Connecting the CV-E500 / XG-E700 to the controller (only when using 3 or more cameras):



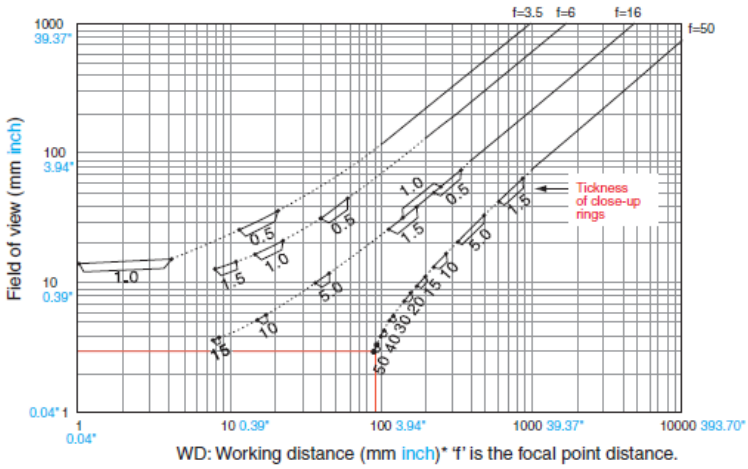
5. Selecting the right lens:

Select the lens according to the size of the target (FOV (Field of view): Y) and the distance between the camera and the target (working distance). Select a suitable lens referencing the FOV chart.



Using and understanding the FOV charts (Lens Charts)

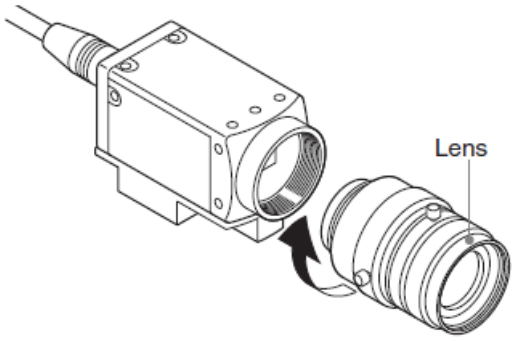
The relationship of lens focal distance, WD (working distance) and FOV (field of view) is shown in the graph (lens selection chart) on the right. The log v log graph shows lines indicating the relationship between WD and FOV for different lenses with different focal specifications (3.5 mm 0.14", 6 mm 0.24", 16 mm 0.63" and 50 mm 1.97"). The WD and FOV for a lens can be determined at the intersection of these lines.
In a range where the WD is outside of the lenses normal specification close up rings can be used to change the focal length of the lens. Close up rings are mounted in between the lens and the camera and on the graph areas of the lens line that have a bracket around them indicate the size of close up ring (mm) along with the WD and FOV range they can be used for.



Example: Using a 50 mm 1.97" lens with a 50 mm 1.97" close up ring you can have a 3 mm 0.12" FOV at a WD of 90 mm 3.54" (intersection of red lines)

Lens Chart found on-
CV-5000: pg. 2-9 thru. 2-15 (CV-5000 User's Manual)
XG-7000: pg. 2-10 thru. 2-17 (XG-7000 User's Manual)

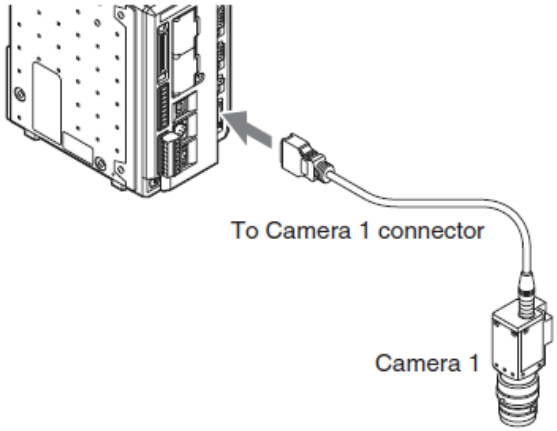
6. Installing the lens to the camera:



► Note

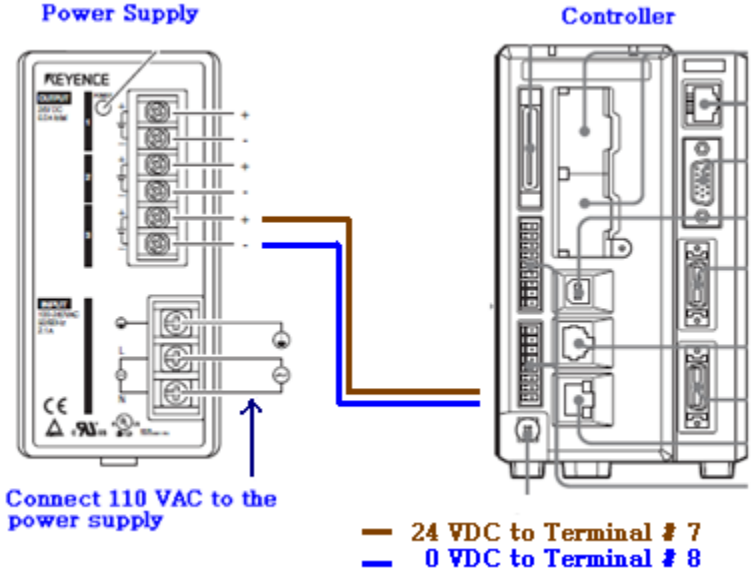
- Do not touch the inside of the camera when installing the lens.
- Take care to ensure dust and/or foreign material does not enter into the camera.

7. Connecting the camera(s) to the controller:

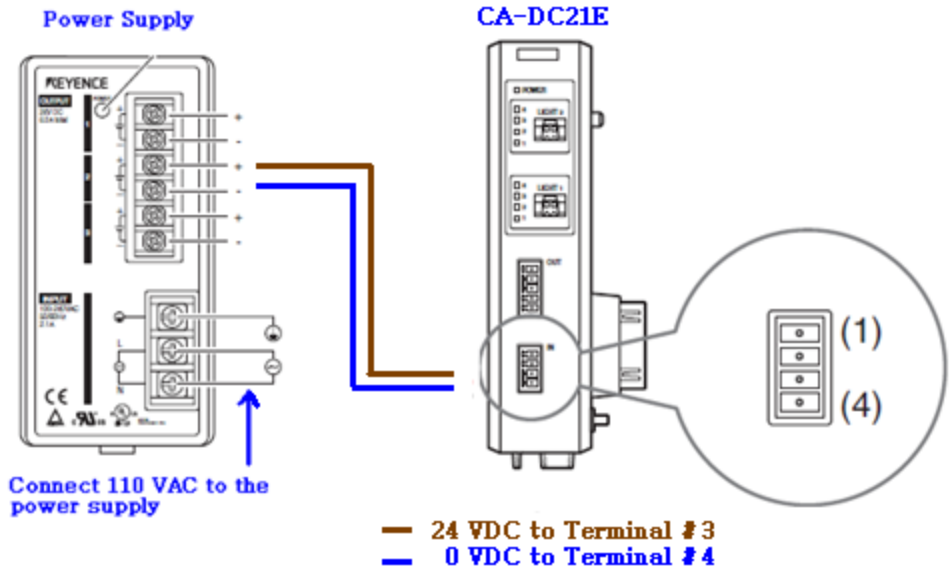


8. Wiring the camera

Connecting the power supply to the controller



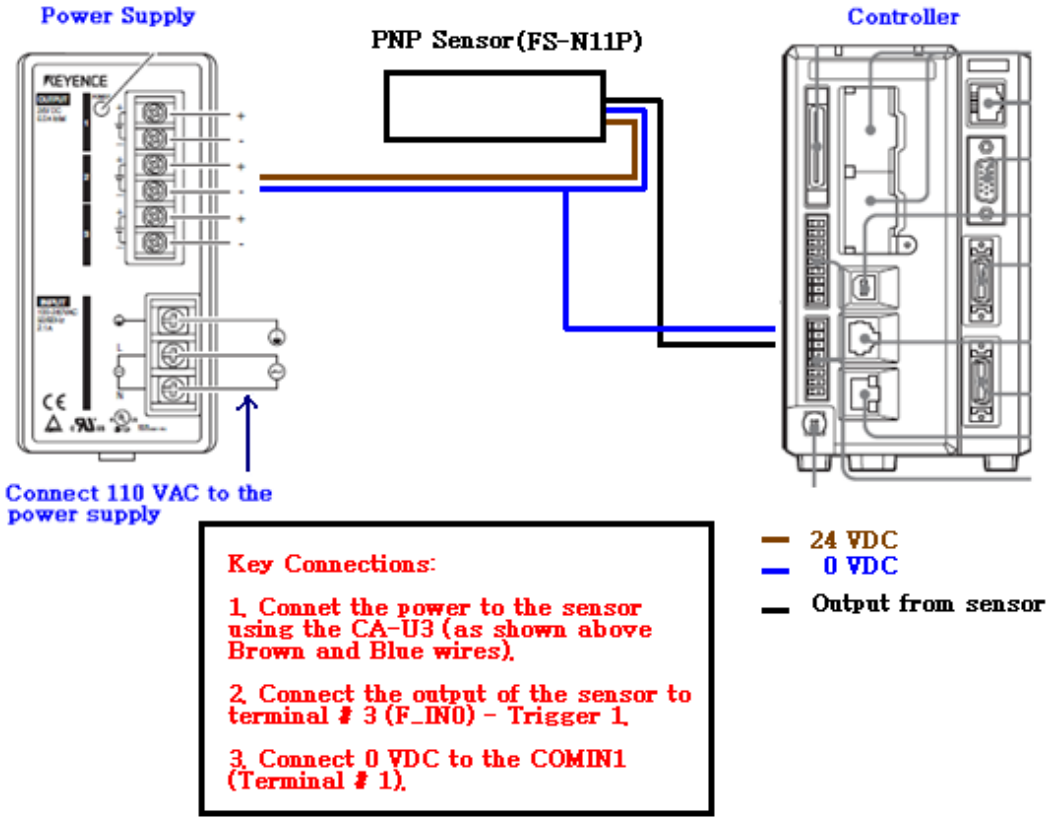
Connecting the power supply to the CA-DC21E



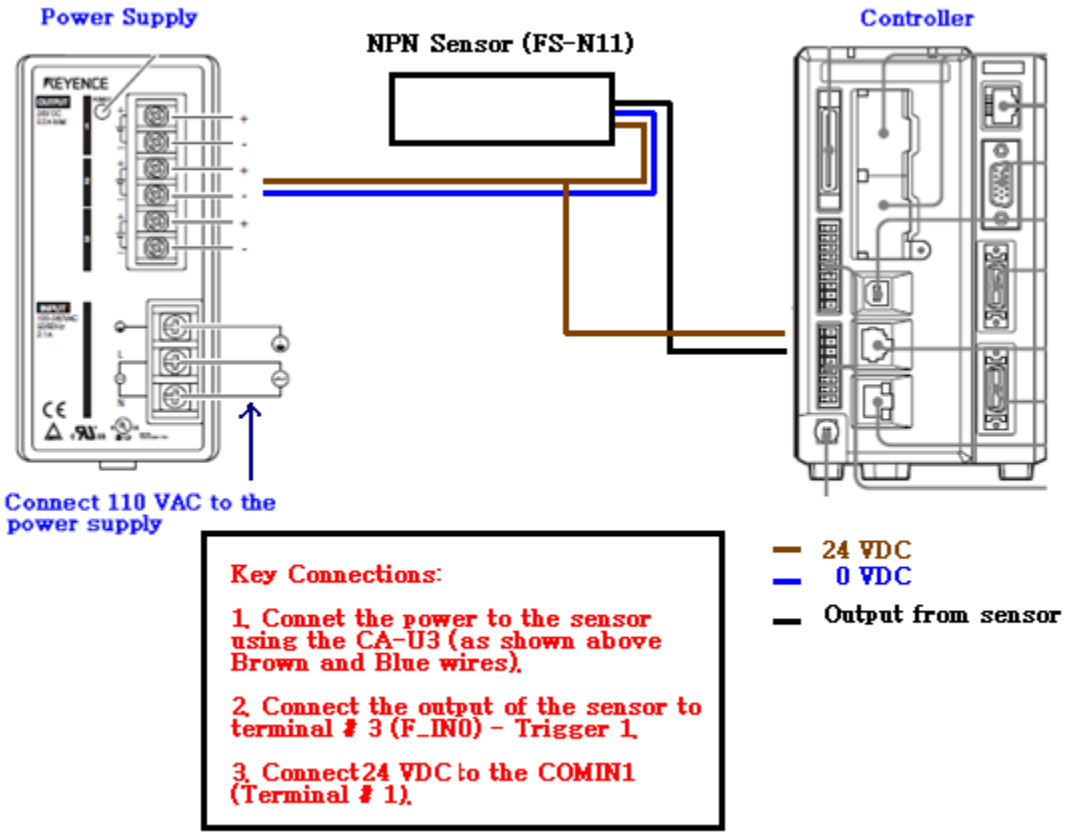
Triggering the camera

The purpose of the trigger is to tell the camera when to take a picture. The vision system can be triggered using 24VDC NPN or PNP input devices (sensors, PLCs, other triggering devices). Here are some brief examples of both an NPN and a PNP trigger sensor for camera 1:

Using a PNP Sensor:



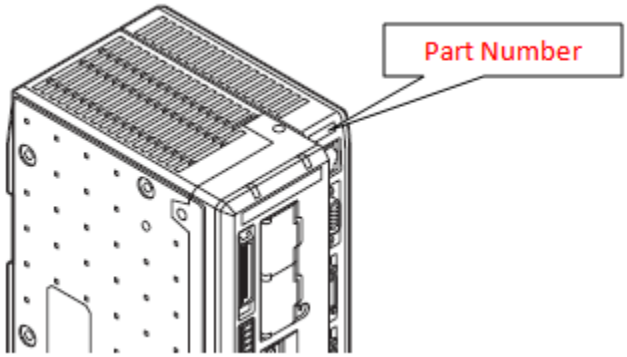
Using an NPN Sensor:



Output results

The vision system can output only either PNP or NPN (depending on the actual model you have). A PNP controller outputs PNP signals and an NPN controller on outputs NPN signals. To verify what type of controller you have – verify the part number located on the upper right-hand side of the controller (see image below).

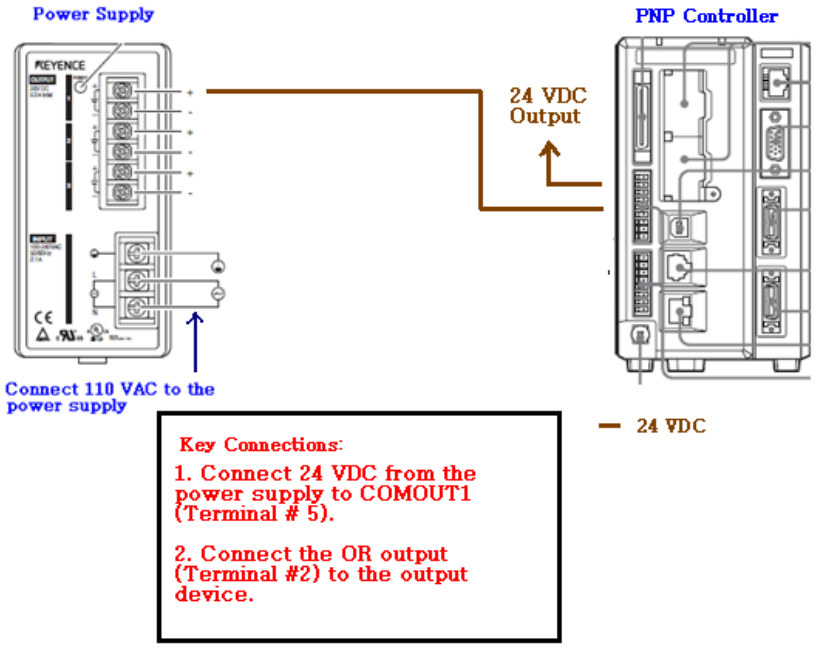
If the part number on the controller ends with a “P”, the controller is PNP otherwise it is an NPN controller.



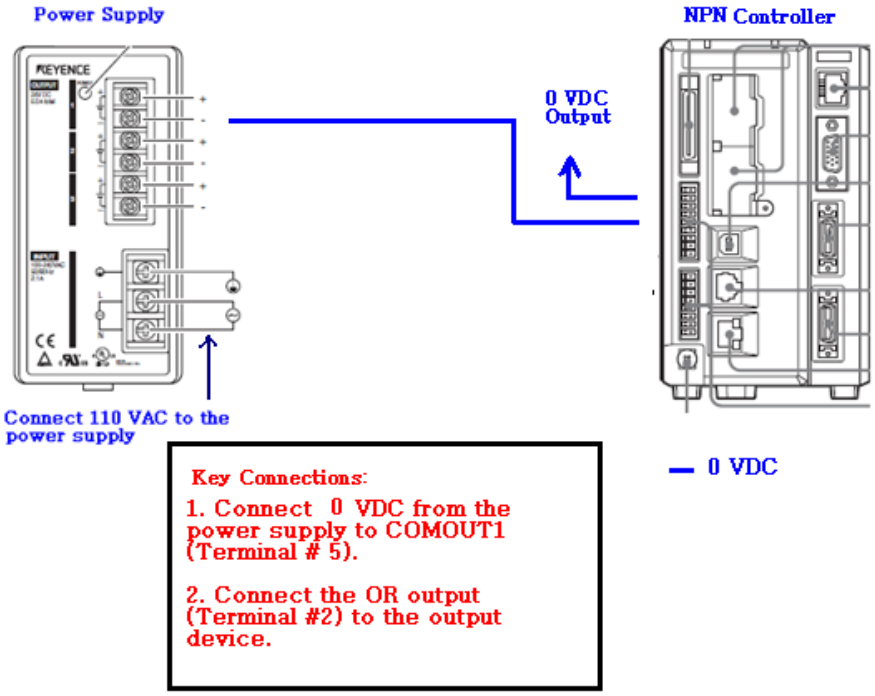
Here is a brief example of outputting with a PNP controller and an NPN controller.

*Note: The vision system can only supply up to **50mA** of current. For devices requiring more current, use a relay.*

PNP Controller

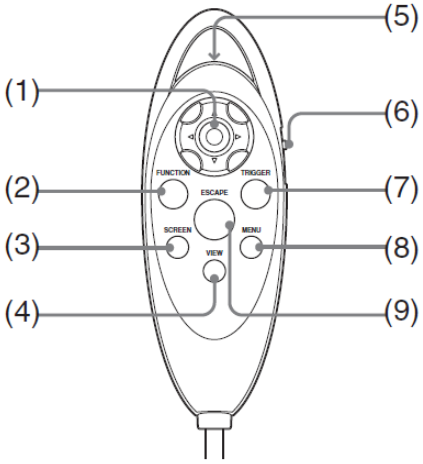


NPN Controller



9. Controlling the system using the Pendant:

Explanation of the buttons



(1) No. 0/8-way thumbpad

Press the outer cursor button up, down, right or left to move the selected item on the screen.
Press the button in the center to confirm the setting on the screen.

(2) No. 1 button (FUNCTION)

Press the button to toggle the function menu on/off (Page 3-2).
It is also setup by default as a combination button.

(3) No. 4 button (SCREEN)

This button cycles the screen through different display types (raw image 1, filtered, etc.) (Page 3-12).

(4) No. 5 button (VIEW)

Press to display the View Toolbar, zoom in or out on the screen, or to switch between options such as result values or display templates (Page 3-9).

(5) No. 7 Back button

This button calls up the function menu, just like the No. 1 (FUNCTION) button. It is also used to toggle the flowchart area on screen between normal and enlarged. Pressing and holding the button displays the entire flowchart.
Some of the button combinations differ from the No. 1 (FUNCTION) button.

(6) Selector switch (8) (RUN/STOP)

Flicking this switch toggles between edit and run modes (Page 4-5).

Reference

This switch can also force the controller to change from remote capture mode to run mode.

(7) No. 3 button (TRIGGER)

Press this button to issue a trigger for all cameras. Press and hold the No. 3 button in the flowchart view to issue a continuous trigger (only when trigger input is enabled). Press the No. 3 button (TRIGGER) again to stop triggering.

(8) No. 6 button (MENU)

This button cycles the dialog menu through different levels of opacity (100% → 90% → 75% → 50% → 25 → 100%).

(9) No. 2 button (ESCAPE)

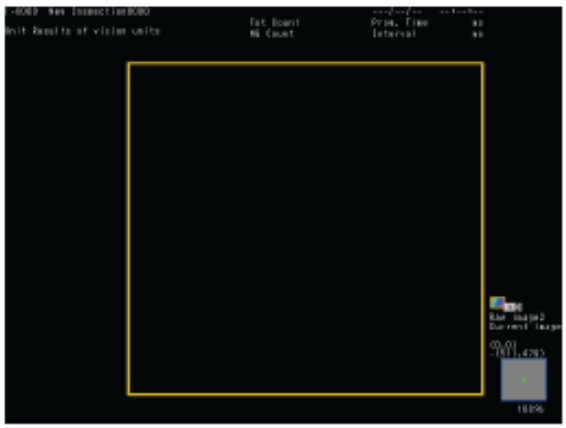
Press this button to return to the previous screen or to resume the previous operation.

10. Powering up and displaying an image:

Note: This procedure can be found on page 2-31 of the XG-7000 User's Manual (ver. 4.0).

1 Confirm that the cables are connected correctly, and then turn on the power.

After the opening screen appears on the monitor, the initial run mode screen should appear.



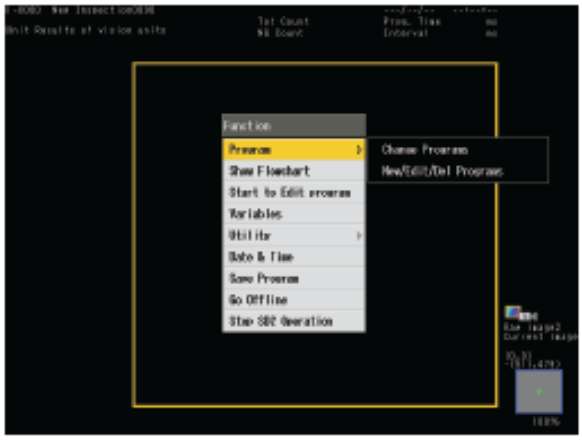
If nothing appears on the monitor

Check the following:

- Are the power input terminals connected correctly?
  - Is a 24 V DC (2 A) being used for the power supply?
  - Have the power input terminals (+24 V) and (0 V) been connected in reverse polarity by mistake?
- Is the monitor cable connected correctly?
- Is the monitor turned on?
- Does the monitor support SVGA (800 x 600 pixel) resolution, and 60 Hz vertical frequency?

2 Press the No.1 (FUNCTION) button on the handheld controller.

The [Function] menu appears.

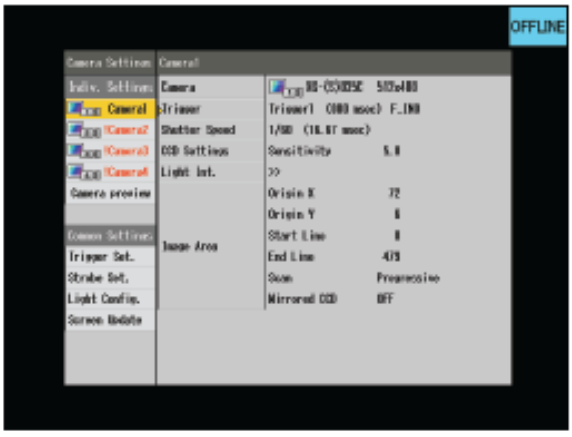


3 Select [Go Offline].

The [System Configuration] menu appears.

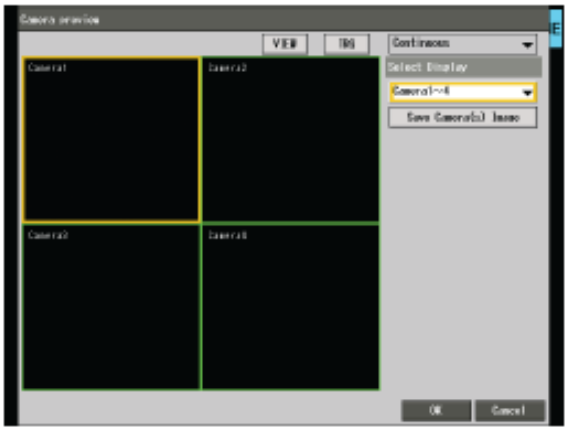
4 From the System Configuration menu, select [Cameras] - [Camera Settings].

The [Camera Settings] screen appears.



5 Select the [Camera preview] under Individual Settings and make sure the active screen from the camera connected to the controller appears.

The active screen displays the image from the connected cameras.



Reference

- You can display the feed on the entire screen by selecting the desired camera under [Select Display]. (Page 5-16)
- You can refresh by pressing and holding the No. 3 button (TRIGGER) on the handheld controller to continuously refresh the data and image on the screen. Press the No. 3 button (TRIGGER) once more and the screen refresh will stop.

If the active screen is not displayed

Check the following:

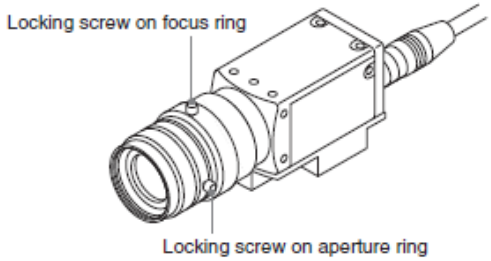
- Are the cameras connected correctly?
- Are the lens caps removed from the cameras?
- Is the aperture ring of the lens closed?

11. Adjusting the lens

The lens has two adjustments (aperture, and focus). The aperture controls the amount of light that enters the lens and the focus handles the degree of sharpness.

For XG-H500C/H500M/H200C/H200M/200C/200M/H100C/H100M/035C/035M/ H035C/H035M/Analog cameras

While viewing the monitor, turn the aperture ring and the focus ring to adjust the aperture and focus.



- Adjusting the aperture: Loosen the locking screw on the aperture ring to make the target and the surroundings brighter / darker.
- Adjusting the focus: Loosen the locking screw on the focus ring to sharpen the outline of the target image.

When the aperture and focus adjustments are complete, tighten the locking screws so that the aperture ring and the focus ring do not move.

12. Return Instructions:

Every trial unit will have an assigned trial unit #. Your trial unit # is located on the upper right hand side of the packing list (noted as the invoice #).

Please package and return the trail unit to the following address:

Keyence Corporation of America
Trial Unit # ( )
909 West Irving Park Road
Itasca, IL 60143

Reference your trial unit number when returning the unit.

Additional Notes: